ANIMALS COMMUNITIES IN MOUNTAIN ECOSYSTEM: A GLOBAL VIEW

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ASBTRACT:

This study examined the impact of animal's communities in mountain ecosystem: a global view. The difference in climatic variables to some extent determines the species of plants and animals in a particular region or habitat. Increase or decrease of animals' population within the ecosystem is a function of prevailing climatic conditions and seasonality of the year. The vegetation pattern of mountain is a function of the soil morphology and amount of precipitation received. Animals have a unique and inter-related function in their ecosystem. The objectives of study ascertain the likely impacts of animals' community in mountain ecosystem as well as the determinant, adaptation and survival of animals within the mountain ecosystem. The study also examined the significant of the biome in animals' adaptation. The methodology adopted was purely on content analysis of secondary data and observed information from field survey. The study also implored observation techniques of the indices of animals' habitat within the ecosystem. The result shows that there exist some level of correlations and competition of animals for finite resources in the ecosystem. The variation in regional habitat and biome determines to a great extent the types and species of animals, adaptation and survival. The result also revealed that adaptation of animals is a function of the viability and sustainability of the biome. The way forward to ameliorate extinction of animals in mountain ecosystem is to maintain an increase in animals' population and also their feeding habitats have to be sustained. The governments at the various levels should intensify efforts on the prevention and invasion of animal communities. Hunting and agricultural practices has to be restricted. Urbanization activities along tracks of forest reverses and mountain ecosystem should be done with caution.

Keywords: mountain, ecosystem, animals' community, habitat and biome

1. INTRODUCTION

Mountains ecosystem formed a unique habitat to animal's community. Mountains are elevations and supreme expression of the landscape. A mountain is a natural rise of the earth's surface; it has a summit or top. Mountains are usually steeper and taller than a hill. Mountains are often thought of as being a hill of over 600 metres (about 2,000 feet), but this thought is not the same in every country. Mountains are important because they usually have water within them, and they are often where water begins to flow. Mountains are like a filter so people can drink fresher water. It provides unique habitats and sheltered for human and wide life and is prone to many dangers. A habitat is where plants and animals of varied species lives and grows. The differences in climatic variables to a great extend determines the species of plants and animals found in a particular region of the world. The forming of a mountain is called *orogeny*. Mountains are formed when rock layers are pushed from opposite sides, and these actions push part of the earth crust up to form a mountain feature. Mountains formation is more to natural forces than anthropogenic. A mountain range is a large group of mountains beside each other. There are varied ways a mountain may be formed. This formation can be through fault, fold, plutonic and volcanic. Generally, there are five main types of mountains formations, these are: volcanic, dome, folded, plateau and fault-block mountains. Of all these varied types of mountains the folded mountain makes up some of the highest mountains of the world where most animals' species thrives. This is

due to the fact that these set of mountains are formed where two continents meet and forming a larger ecosystem of animals' habitation.

The vegetation patterns of mountains types is a function of the soil morphology and amount of precipitation received. Animals' species are numerous and diverse and ranges from the vertebrates and invertebrates. These varied species of animals are found in all the regions of the world (temperate, equatorial, polar and tropical). Animals' species that lived within the mountainous regions do not only have to withstand the dramatic and climatic changes in temperature but also of the lower oxygen levels of such altitude or ecosystem. The average rainfall of mountainous areas per year ranges from 80mm-1000mm while annual temperature of same region ranges from 45 to 30 degrees centigrade. The plants species are diverse in nature. They include mostly of conifers, grasses, oak, pine/spruce/fir, alpine and shrubs plants etc. The species of mammals (therapsids) in the tropical and equatorial regions include reptiles, monkeys, apes, mountain gorillas, llama, elephants, deer's etc while the likes of cougar, birds of prey, deer's thrives more in the temperate regions. However, the habitation of animals' in mountain ecosystems is a function of the prevailing biological communities known as biomes. In all mountainous regions, the lower the temperature, the greater the precipitation and viz-a-viz. As vegetation changes with elevation so also is the habitation of animals. However, the habitation of animals in mountains areas is a function of the prevailing biome in that ecosystem.

A mountain ecosystem is the grouping or assemblage of plants and animals' species of different types and kinds and the microbes in their natural state (forest, grassland, pond and mountains) regions etc. (Wright and Nebel, 2002). In essence, an ecosystem is a biotic community of plants, animals and microbial communities with high level of inter-relationships and interactions between the co-existing population of species within a given territory or geographical location. Before modern development, Nigeria's diverse habitat of mangrove swamps, tropical forests, savannah, and mountain plateaus supported a diversity of plants and animals species. However, over the last several decades, vast tracts of animal's habitat have fallen victim to anthropogenic factors. These could be attributed to rapid population growth and the expansion of farmland. The widespread hunting of wildlife for food and others purposes has also threatened the animal population. Consequently, Nigeria's few remaining elephants, buffalo, lions, leopards, and other wildlife's or large game are generally found only in few remote areas or inside major forest reserves. Smaller animals such as antelope, monkeys, jackals, and hyenas are more widespread. Hippopotamuses and crocodiles, however, are still common in major rivers and oceans. Birds, including species that migrate seasonally between Africa and Europe, are also in abundant. There is a high level of predator-prey relationships in animals' ecosystems.

During harsh or adverse climatic conditions, the population of certain species of insects, birds and mammals may reduce and thereafter increase during favourable conditions. However, the reduction and increase in population of animals at varied seasoned of the year is a function of how sustainable the biome and ecosystem is. An increase in population of large mammals (predator) e.g. wolves, leopard has significant effect on smaller mammals (prey) e.g. moose. An increase in population (Biotic) and decrease (Environmental Resistance) in the animal ecosystems can be maintained in two ways: for population increase, this can be (a) through: reproductive rate, ability to migrate, ability to invade new habitats and the ability to cope with adverse conditions. For population decrease this can be (b) through: lack of food and water of suitable habitat, adverse weather conditions, predators, disease and parasites. However, stability in population is the result of the interactions between factors tending to increase population and factors tending to decrease population (Wright and Nebel, 2002).

1.1 AIM AND OBJECTIVES

The aim of this study is to examine the likely impact of animals' communities in mountain ecosystem. In order to achieve this, the study has the following specific objectives:

(i) To identify the impacts of mountain ecosystem in animals community.
(ii) To determine the adaptation and survival of animals in mountain ecosystem.
(iii)To determine the effects of animals interactions in mountain ecosystem.

1.2 METHOD OF STUDY

This paper is purely on content analysis. It utilises evidence mainly from secondary data and observed information from field survey. Secondary data was derived from literature review on the indices of animal's communities in mountain ecosystem. The study also implored observation techniques of the indices of ecosystem.

Fig 1: A **Predator in Captive of a Prey**

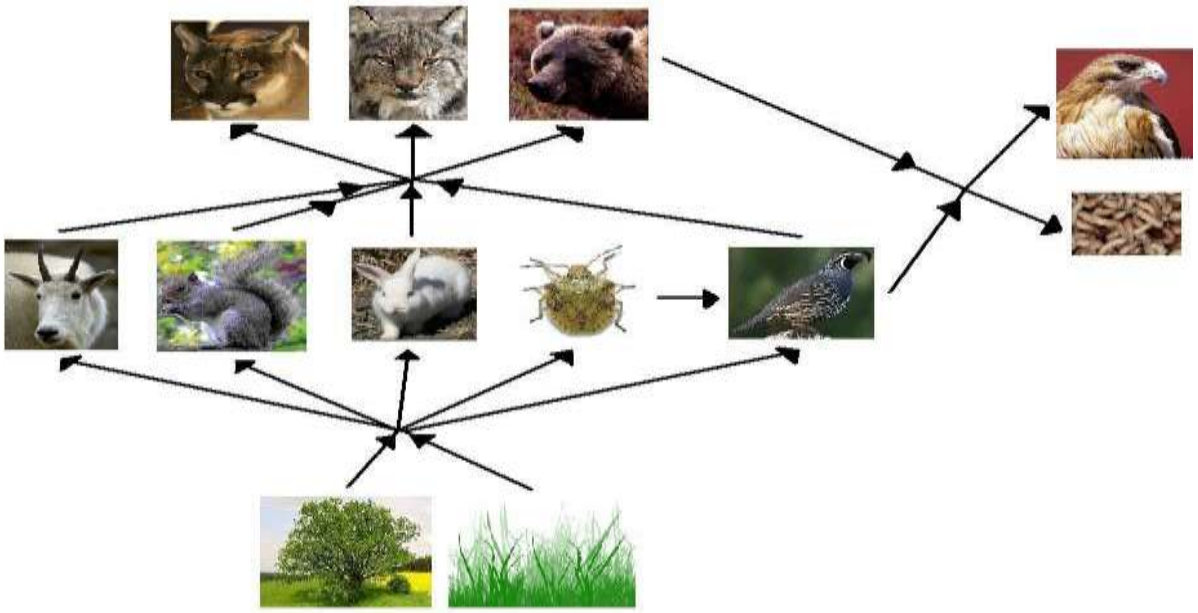

Fig 2: An Ecosystems Food Web:

The above shows the food web pattern of the animals' ecosystem. The food web starts from the primary consumer to secondary and tertiary. It also determines the interdependence and correlations within the biotic animals' community. The level of interdependence is on the biotic-primary, biotic-secondary and biotic-tertiary consumers. The Biotic-Primary-Consumer are mainly producer of food in the web pattern, they include (tree, grass, mountain goat, squirrel, rabbit, beetle and quail), the secondary are mainly consumers, they include (cougar, linx and grizzly bear), while the tertiary are hawk and maggots, they feeds on dead things. The diagram (left to right) shows the web pattern of animals in temperate and Polar Regions and their food web pattern. However, the Tree and Grass-Biotic-Producer provides food for lots of animals on a mountain, and these are definitely important to animals' survival. Apart from the supply of food, they also make for air fresh and clean mountain ecosystem.

2. ANIMALS' COMMUNITY

There exists a high level correlation between the biotic and abiotic animals in mountain ecosystem. The focus here is on the interactions and inter-relationships that exist among the various species of animals in their varied communities. There also exist some levels of interactions and inter-relationships between the large mammals, birds, reptiles and amphibians down to small earthworms, tiny insects and mites. In addition, large array of microscopic bacteria, fungi and protozoan also thrives in the animals' ecosystem. Primary attention is given to the complex pattern of interactions among the many species of animals constituting a community. Ecology has been central to the development of conservation and environmental control during the past 20 years. This has revealed the deleterious effects of pesticides and industrial pollutants and has provided important insights into wiser management of agriculture, forestry, and fisheries. Within the animals' community, there are sub-fields of study and delineation for easy understanding. For example, the evolutionary zoology studies of the history and mechanisms of evolutionary change and adaptation of animal groups.

These systematic sub-fields, study the delineation and description of animal species and their arrangement into classification. The phylogenetics studies the developmental history of groups of animals within community while zoo-geography, studies the distribution patterns of

animals over the earth surface. The community structure of the organization of a biological community with respect to ecological interactions in one habitat and ecosystem could be similar or at variant. However, animals species interacts and relates with one another in various ways within a given ecosystem: these could be in the areas of competition, predation, parasitism, mutualism and commensalism etc. in the animals community, the phenomena of competition prevail than any other.

Competition**:** Animals species can compete with each other for finite resources. This is considered to be an important limiting factor of population size, biomass and species richness. However, many types of competition have been observed and described, but proving the existence of these interactions is a matter of debate. Direct competition has been observed between individuals, populations and species, but there is little evidence that competition has been the driving force in the evolution of large groups of animals with a given community. For instance; among the amphibians, reptiles and mammals etc. habitats there exist some forms of competitions such as:

a. Interference Competition**:** This occurs when one animal population attacks, or consumes the resources, of another e.g. a lion chasing a hyena.
b. Exploitative Competition: This occurs via the consumption of resources, that is when an individual of one species consumes a resource (e.g., food, shelter, sunlight etc.), that resource is no longer available to be consumed by a member of a second species. Exploitative competition is thought to be more common in nature, but care must be taken to distinguish it from apparent competition.
c. Apparent Competition: This occurs where two species of animals share a predator. The populations of both species can be depressed by predation without direct exploitative competition.

3. MOUNTAIN ECOSYSTEM

The mountains ecosystems are found throughout the world. But more of mountain ecosystems are found mostly in forested areas of the world and distributed sparsely from the equatorial regions to the poles. The mountains ecosystems occupies approximately one-fifth of the total land mass of the earth surface Cunningham and Cunningham (2012). However, Wright and Noble (2012), in line with Messerli and Spiess (1997), states that mountains are remarkably diverse; and that such ecosystems are characterized by harsh environmental conditions due to altitude differentiation. These includes often long lasting snow cover, short growing seasons and topographically related disturbances such as avalanches, rock fall or landslides and steep gradients etc. The steep gradient on mountain side plays some major roles in sighting from distance of their prey and also of the ease of mobility and possible defense.

The inhabitations of animals and plants species are generally well adapted to mountain ecosystems irrespective of environmental factors and repelling conditions. The habitation biomes and ecosystem plays an insignificant role in the attainment of this. The animals may react sensitively (positively and negatively) to changes of climatic patterns, land-use and disturbance regimes. Mountains are found on every continent and at varied altitude, it locations ranges from areas close to sea level and to the highest place on the earth e.g. the summit of Mount Everest (9985m) on the border between Nepal and Tibet Autonomous Region of China. In Africa, most of the great mountains are concentrated in the Eastern Region than any other regions e.g. Mt. Kilimanjaro (5895m) in Tanzania, Mount Kenya, Mount Meru and Mount Elgon all have a

unique animals communities etc. In Nigeria, the forest and savannah parks and wetlands are rank among the continent's most important landscape. Nigeria's biologically diverse landscape encompasses lowland and mountain rainforests, mangroves, swamps, and mountain grasslands.

Yet the proliferation of farmlands for agricultural practices and large-scale timber harvesting forecasts bad news for native wildlife, particularly the African Elephant and the extremely rare Cross River gorilla are some of the wild animals associated with the mountain ecosystems. The gorillas and elephants need large, continuous ranges to adapt and survive. Gorillas spend much of their day eating (consuming a primarily vegetarian diet of leaves, stems, shoots, and fruit). They travel between feedings, covering a distance of several hundred yards to a mile or more in a day. In lowland forests where gorillas eat a substantial amount of fruit, the slow passage of seeds through their digestive tracts serves an important ecological process. A sizeable number of animals (lower and higher) in the mountains community live in caves while others live on trees, earth and mountains top. In Africa in general and Nigeria in particular, the varied animals species are under series declineation and threat owing to anthropogenic factors (agriculture, lumbering, urbanization, industrialization etc.) The population of these threatened species is declining across the continent. However, the characteristics of the wildlife mountain ecosystem in Nigeria are as follows:

- Cross River gorillas were once common in some parts of South-Eastern Nigeria, but their populations have declined due to man activities (farming, lumbering, deforestation and born-fire). These have helped to destroyed and damaged their forest habitation.
- Cross River National Park forest reserves, provides important gorilla habitat. Some of the park's reserves date to the 1930s, when established communities were permitted to remain inside the forest and a series of enclaves were created to accommodate them.
- The sheltering of the mountain ecosystems provides critical habitat for primates such as the Nigeria-Cameroon chimpanzee, red colobus, Sclater's guenon, and Preuss's guenon.
- Elephants, which once roamed across Nigeria, live only in a few protected areas today.
- The mountains communities accommodated some leopards, lions and African wild dogs.

4. COMMUNITY STRUCTURE

The pattern of community structure of animals in the mountain ecosystems varies from one region to another. Since the earth encompasses many different climatic regions and habitation (biomes) certain species thrives more in certain areas than other. Each biome is home to a characterized community of animals species. Similar species of animals are found within the same vegetation belt. For example, in the rain forest ecosystems in Africa, Asia, and South America with has similar climatic characteristics of variables, same species of animals and ecosystem habitats across the world have unique resemblance and habitations. Also, animals of deserts regions are not exempted. In addition, some unique animals are found in saltwater and freshwater environments. Rainfall and temperature plays insignificant roles in determining the types of organisms that live in each biome. However, geographic features of an area shaped the distribution of organisms within the ecosystem. Rivers and lakes habitat attract specific birds, insects and animals; the cold temperature of mountain tops results in adaptation of species that are similar, or have similar adaptations and also of those found at the poles. The ptarmigans for example, are cold-adapted birds and bears found in the arctic and in the alpine regions of mountains at the equator. However, majority of the animals of mountain ecosystems are wild and carnivores in nature. Each biome of an ecosystem has a unique food web for animals' habitation

and survival. Apart from the Nigeria situation, this paper also examines the community structure of animals of others regions of the world.

- *Tropical Regions Biome:* In this region there are more diverse community structures. The biome of the region is gorgeous, adaptive and sustainable to the most varied and productive animal communities on earth. The warmth and abundant moisture of the rain forest supports close-growing trees with dense canopies and epiphytes that sustain a great variety of animal species. In most countries in Africa and Nigeria in particular, the biomes play an important role in animals' formation, development and adaptation. Grasslands support great numbers of grazing animals and the mountains ecosystems support such animal species as the reptiles, monkeys, apes gorillas' antelope and deer's etc. The steep gradient of the mountains enables these animals to exercise their strength over their prey.
- *Polar Regions Biome*: The cold, mossy tundra biome of the poles attracts vast clouds of mosquitoes and flies. This attracts many insects and flies. This habitat draws many species of birds to feed during the brief, cool summers. In turn, small mammals like the arctic fox eat the eggs and young offspring's of ground nesting birds. The same goes for animals' species in water bodies. Caribou graze on the grasses, moss, and lichens; and lemmings and arctic hares provide food for the bears and other large predators. In south of the tundra, the taiga biome, or boreal forest, encourage conifer forests of pine, spruce, fir, and hemlock. The dense growth of the conifers stands provides shelter and good breeding ground for small animals 'like the lynx, wolverine, porcupine, snowshoe hare, and small rodents. Wolves prey on the lynx and other mammals; black bear and grizzly bear munch on berries, nuts, and buds; and mule deer and moose browse on shrubs.
- *Temperate Regions Biome:* Is this region, the varied rainfall pattern and seasonal temperature encourage more animal diversity than the tundra and taiga biome. Rabbits, raccoons, squirrels, opossums, and a variety of birds make their homes in these forests. Human encroachment has made wolves scarce, the predator that once controlled the abundant deer population. The bear fox, and mountain lion that prey on the smaller animals are also declining as forests give way to pavement and lawns.
- *Desert Regions Biome:* The desert biome is characterized with low rainfall and high temperature which harbours a diversity of animals. Rodents such as the kangaroo rat feed on fruits and seeds of desert plants while lizards and snakes prey on rodents, bird eggs, and insects. Mammals, including the dingo of Australia and coyote of North America feed on rodents, insects, and the dead flesh, or carrion, of other animals. Many desert animals survive the heat, night hunting and hide in burrows during the day. Animals such as kangaroo rats seldom drink water because of their efficient kidney systems that enable them to get all the water they require from their food.

- *Mountain Region Biome:* The mountain biome is characterized with varied species of animals ranging from small ants to large wildlife. Insects, birds, monkeys, black snakes, and beavers constitute the smaller animals while the buffalo, lions, elephants, gorillas and leopards constitutes the larger animals. The buffalo and lions has retreated in many places as a result of hunting, lumbering, settlements and agricultural activities and of the virulent disease called rinderpest, but their population (mostly the buffalo) still remains over a million in most tropical and fold mountain regions of the world. Before modern development, the various biomes in Nigeria have supported a diversity of large and wildlife of animals.

However, within the mountain animals' ecosystem, there are high levels of migration process of most species of animals in search for prey/food during off seasoned. These movements mostly of

the birds' family could be on daily, weekly and seasonal bases. At time these movement could cut across regions.

5. FUNCTIONS

Animals' communities have a unique and inter-related function. The continuity and sustainability of any community depends on these functions. However, there are six essential functions within the animal community. They include;

- Movement: All animals move from place to place in search for food, water, and for defence. Some forms of movement may be slow e.g. insects while others may be fast and quickly e.g. lions, monkeys, leopard and birds etc. Some movement can be for short distance and duration while other may be long or even seasonal. A harsh climatic condition induces movement of animals. At times, these movement or migration may be necessary for defense or from areas of deficit (prey/food) to surplus or for pleasures as in the cases of birds during on and off seasons. Movement up and down the mountain is vital in the animals' community mountain ecosystems.
- Feeding: All animals need food to live, grow, and replenish. Food or nutrients is a necessity for all living things, without food or proper feeding habitat no animal community can thrive. The adaptability of most animals in certain habitat is a function of the availability of food. However, for animals to feed and sustained their feeding habit there is need for movement.
- Reproduction: All living things reproduce for continuity and to prevent extinction. Animals irrespective of their species must give birth since procreation is essential to all living organisms. However, reproduction helps to sustain the animals' community from extinction.
- Respiration: Animals' take-in oxygen from the atmosphere and give out carbon dioxide in exchange. Respiration connotes life in animals and this determines their existence, sustainability and habitation. Even the lower animals in their burrows respirate irrespective of their depth of habitation. No animal can survive without a functioning respiratory system. However, the animal's community enjoys some forms of better respiratory atmosphere than human beings. Their habitation helps to purify oxygen gases. Good respiratory system helps keep internal organs stable. Most animals' respirates through their skin, nose, mouth etc.
- Excretion: Excretion in animal is a function of the in-take of food, water, vital nutrients and vitamins for growth. All animals excrete irrespective of their size, nature and species. Excretions in animals can be from their skin, hair, mouth, anus, body etc. Since excretion helps to maintain body metabolism, these act helps the animals' species to eliminate body wastes and to maintain balance health system from harsh environmental conditions.
- Response: Animals are quick to react to stimuli mostly to adverse situation. Their senses of reasoning, smelling, hearing and sighting organs are well developed irrespective of the nature. As earlier stated, all animals form their territory, marked and recognize their territory. They are quick to sense and response to unusual sign, sound, noise, attacks and invasion. They are also, quick to response to changes in climatic conditions.

However, from the above the function of movement and feeding habitats are more essential to animals for their growth, reproduction and sustainability in the mountain ecosystem.

6. DYNAMICS

Dynamics in animals' ecosystems is to maintain a perfect equilibrium of animals within the ecosystem. This concept aims at maintaining animal population equilibrium and avoids extinction

of animals' species. The populations of many species tend to remain more or less constant is size and with favourable geographical distribution. An average death should equal births otherwise the population will shrink. The rate of biotic potential and environmental resistance as mentioned above are responsible for the dynamic states of the ecosystem. Favourable biotic potential promotes more births while environmental resistance adverse more deaths. The population dynamics must be at equilibrium to maintain a perfect state as existence and continuity of the ecosystems. Each species of animals exists as a population. The diversity of the animal's species to some extent enhances the area coverage and ecosystem.

7. EFFECT OF HUMAN INTERACTIONS

The most threatening of all human interactions and devastation of animal community is massive bush-burning, urbanization, lumbering and agricultural activities among others. Many scientists predict that the steady increase in atmospheric carbon dioxide will lead to substantial increase in global temperatures, environmental imbalance and climate change. This together with disruptions in global patterns of precipitation may cause an increase in temperature and biomes shift hence the movement of animals. In North America for instance, the biomes are expected to move northward from 50 to 200 km over the next century. Scientists predict that regions of the temperate zone will experience a tropical climate, and animals within have to adapt to tropical climate. The scientist predicted that the change will occur too rapidly in all the biomes. In Nigeria for examples, human interactions such as hunting, bush burning, agriculture, urbanization etc, have not only help to reduce or extinct animals species but also confined the species to certain biomes, forest and games reserves for safety as in the Obudu, Idanre hill and Afik mountain forests which serves as rehabilitation centres for tree monkeys, African chimpanzees and gorillas etc. Human interactions, exploitation and encroachment have aggravated the endangerment of animal species. Excessive hunting and deforestation cause habitat loss of animals' community.

8. ADAPTATION FOR SURVIVAL

Adaptation is about the feeding condition and living habitat of the animals. Any creature that lives in t mountains ecosystem must be able to cope with changing temperatures and climatic condition. For every 200 meters an animal goes up a mountain, the temperature drops by 1 degree Centigrade. Plants are very seasonal in the mountains and those plants that do occur all year round, such as conifers, must be extremely hardy and able to deal with the cold. Being able to adapt is a matter of life and death. Animals that cannot adapt die or get extinct with time. Adaptation in animals is a function of certain developmental, physical and behavioural features animals' posses. Some adaptation depends purely on physical features e.g. fish while a majority depends on certain behaviour exhibited e.g. mammals. In a mountain ecosystems, the mountains top and trees help make certain species of animals to thrive e.g. monkeys, koalas and gorilla, sense food and sight danger. The steepness and nature of terrain shield them from attacks. Most beast of burden e.g. camels have many adaptation features that allow them to live successfully in desert conditions. The porcupine of the grassland regions has a unique adaptation (quills) that shield it from attack. Adaptations of animals to a particular environment are evolved over period of time. Animals form territory and marked their territory irrespective of the size of the animals. Adaptation of animals varies from one climatic belt to another.

The survival of animals is a function of the territory it thrives and the landscapes they occupied. Mammals have to overcome a wide range of hazards in order to survive. Animals have to acclimatized and adapt to the challenges of the environment, such as extreme cold and heat while are constant and predictable features of life. Some adaptation conform to special forms of

behaviour e.g. hibernation and migration. Attacks by predators (mostly carnivorous) present quite different challenges. For most mammals, the key to surviving them lies in keen senses and rapid responses. In open field, most plant-eating mammals use special danger signals that warn if an attack is imminent. Rabbits stamp their hind feet on the ground if they see or hear danger. Grazing mammals e.g. antelopes, give a bark like alarm call when they sense an unfamiliar scent in the air. These sounds bring feeding to an instant halt, re-group and ready to run. African vervet monkeys have specific alarm calls that are used for three kinds of predators' eagles, leopards, and snakes. The eagle call makes the monkeys run for dense cover, while the leopard call sends them running up trees to the highest branches. On the other hand, the snake call simply increases general wariness as the monkeys continue to feed. Many mammals communicate by scent, and mark their territories with strong-smelling secretions that are produced by special glands. In some large grazers, such as African and Asian buffalo, they can span over 1.5 m from tip to tip, making them formidable weapons. Spines and quills are only anchored in the skin, but they grow over large parts of the body. Animals such as echidnas and hedgehogs use their spines as a passive form of defence, but the porcupines use their quills in a much more active way, charging backwards to leave them embedded in an enemy's mouth or skin. The teeth of a hippopotamus are large enough to slice through a crocodile menacing its young. The tusks of a walrus can be over 61 cm (2 ft) long; can sometimes fend off attacking orcas, or killer whales. Many small mammals, such as rodents, are vulnerable to attack from birds or other predators when they feed in the open. To defend themselves these animals employ camouflage, they use their natural coloring to blend in with their surroundings. Certain predators, such as the tiger, employ camouflage to remain unseen until they are ready to pounce on their prey.

Elephant populations are on the brink of extinction due to poachers activities for their ivory tusks. Elephant eyesight is poor, and the eyes are small in relation to the enormous head, which can turn just slightly from side to side. This limited movement results in restricted side vision, and elephant must move its whole body to broaden its range of vision. Its other senses hearing, smell, taste, and touch are acute. The most sensitive organ is the trunk, used for picking up scents of food and danger from the ground and air. Elephants can smell water at great distances and can hear certain sounds from more than a mile away. The eastern gorillas on the other hand, live and adapt better in the mountain ecosystems than the western gorillas. In Africa, the eastern gorilla adapts and survives in the Democratic Republic of Congo, Rwanda, and Uganda while the western gorillas live in the western portion of central Africa (Gabon, Republic of the Congo, Cameroon, and Central African Republic). Mammals in mountains, tundra, and deserts regions have to overcome hostile conditions if they are to survive. Rodents have successfully colonized all three of these habitats, because their small size enables them to avoid extreme conditions by hiding away underground or in burrows beneath the snow. On the other hand, larger mammals do not have this option; instead, they cope with cold and a layer of insulating body fat. Some mammals, such as ground squirrels, survive cold winters when food is scarce by entering a sleep like dormant state called hibernation and awaken when food is more abundant. Larger mammals survive desert heat with a number of adaptations, including sweat glands that produce perspiration to cool the body.

To combat arid conditions, many desert and mountains mammals of high altitudes have a sophisticated kidney function that produces concentrated urine, where less water is removed from the body. At high altitudes, mammals face the additional challenges of shortage of oxygen. In the Andes Mountains of South America, guanacos, llamas, and alpacas have successfully overcome this challenge by having more oxygen-carrying red blood cells than most mammals. These animals have special form of haemoglobin, the oxygen-carrying pigment in blood, which binds oxygen at very low pressures. This adaptation allows them to run effortlessly at altitudes of up to

4900 m. Furthermore, certain animal's species in some mountain regions like the amphibians have adapted to living their lives in the safety of caves and crevices.

9. CONCLUSIONS AND RECOMMENDATIONS

The population of animals' communities is on the decrease owing to human activities. Over the last several decades, vast tracts of animal habitat have fallen victim to rapid population growth (industrialization and transportation) and also of the expansion of farmlands. The widespread hunting of wildlife for food and raw materials has also threatened the animal population. Mountain ecosystems are found all over the world. All mountains ecosystems have peculiar characteristics, features and behaviour even with weather and climatic differences. Animals form territory and marked their territory irrespective of the size of the animals. Adaptation is based on physical and behavioural features of animals from region to region. Animals thrive to adapt over harsh conditions and inherent challenges of the various biomes. Consequently, in Nigeria's few remaining elephants, buffalo, lions, leopards, and other large reserves and game forests are restricted to remote areas or in major reserves. Smaller animals are more widespread than larger once. Hippopotamuses and crocodiles, however, are still common in large rivers. Birds migrate seasonally between Africa and Europe and are on the increase.

There is more to be done to sustain better network of animals' community. To maintain increase in animals' population, their feeding habitats have to be sustained. The governments at the various levels should intensify efforts on the prevention and invasion of animal communities. Natural forests reverse, and parks should be protected to avoid further reduction or extinction of certain species of wildlife. Hunting and agricultural practices has to be restricted. Urbanization activities along tracks of forest reverses should be done with caution. Natural forests reverse, and parks if well annex can promote tourism and revenue generation to individuals and government.

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